

What we've learned from past efforts on
transport-land use-environmental
interrelationships –
and what we need to do

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1) The Scientific Relationships are Well-Established

- There's a huge literature on the scientific basis for connecting T, LU, ENV and energy – some of it going back centuries!
- Starting in the 70s this literature included advanced modeling (logit, nested logit, revealed preference, stated preference) which are still the most sophisticated methods used.
- Starting in the late 80s/early 90s the literature included calculations for CO₂ emissions.
- Most of the findings on basic relationships & consumer responses to policy interventions remain valid – and can be easily updated to current emissions rates, populations, etc.
- **We don't need to reinvent the wheel - we do need to read!**

Research and Even Lag Best Practice!

- Nat'l Assn. of Regional Councils, EPA, DOT sponsored guidance on modeling and analysis acceptable practices and best practices in early 90s, but many agencies still aren't up to speed.
- The Federal Transit Admin. (best modeling guidance on transportation analysis) is likely to issue stronger requirements for large MPOs based on work done over the past year.
- Methods used for CEQA review and cost-effectiveness calculations for projects, including emissions reductions, are among the weakest and are often biased.
- Innovations in analysis methods are still occurring, but the **last** generation of models is being implemented!

Three examples of poor methods in common use

- Evaluating highway projects without considering induced demand (in congested areas, new projects typically lead to shifts in time of travel and mode and destination choice that “use up” capacity; also lead to location shifts)
- Using standard ITE trip generation rates without regard to modal opportunities, land use mix, etc (overestimates traffic/auto demand and undervalues pedestrian, bike, transit travel and trip linking)
- Evaluating emissions reductions as tons per dollar cost of project (ignores other costs and benefits which are not comparable across projects, understates benefits of demand management)

3) What We've Learned from Analysis and Practice:

Transportation Supply-Side Interventions

- **Supply-demand interactions (feedback effects) can be significant even if elasticity of demand is modest:**
 - Higher fuel efficiency lowers the out of pocket cost of driving and at the margin is a factor in more auto use.
 - Capacity increases (new lanes, traffic flow improvements) can shift time of travel, destination, trip frequency, location choices; capacity gets used up quickly in growth areas.
 - Transit in low density areas costs a lot and may actually use MORE energy than driving
 - Congestion isn't always a serious problem – it depends on individuals' experience and the choices available.

What We've Learned (cont.): Demand Management

- **Demand management can be effective, but only if strategies are well matched to markets. Among the most effective strategies:** employer-based programs where employers see a gain in lowered costs for transport, higher employee productivity, bigger labor shed:
 - deep discount transit passes
 - Carpool parking incentives
 - “First and last mile” shuttles
- **Casually deployed demand management strategies can be counterproductive, e.g.:**
 - Two person carpool incentives mostly sort out family members traveling together rather than remove a car that would otherwise be on the road .
 - Parking pricing can move parkers to streets in nearby neighborhoods unless there's regulation there as well.

What We've Learned (cont.):

Land Use-Transportation Interactions

- **Density is necessary but not sufficient for transit to flourish**— you need density to generate enough riders, but you also need walkable / bikeable urban design.
- **Resident or worker-serving uses within walking distance of residences can capture many trips**, increasing the use of transit/walk/bike modes and reducing trip length for all modes. (Accessibility counts!)
- **Location choice is affected by transportation services, but also by many other factors:** housing (or commercial property) size, price, and lot size, neighborhood amenities, environmental factors, school quality, race, ethnicity, class, income - **creating sustainable communities is not JUST a design problem but a social, economic, and environmental problem**

What We've Learned (cont.): Environmental Considerations

- **Life cycle analysis can change environmental benefit-cost ratios** – considering production, use, and recycling/disposal is important, rather than just use.
- **Details matter** – cold starts, idling, acceleration and deceleration, liquid spills, tire inflation, vehicle maintenance can be very important in determining impacts.
- **Distribution of impacts matters** – impacts can be highly concentrated (pro or con) in particular neighborhoods, districts, ethnic groups, age groups, businesses, industries and can be hidden if analyses are always done at the regional scale or for zonal aggregates.
- **System effects are abundant**: not just primary but secondary and cumulative impacts, time-dependent impacts, feedback reinforcement and dampening.

What We've Learned (cont.): Implementation

- **Changes in transportation and land use policies and practices succeed or fail on public understanding and acceptance / support, not on the fanciness of the analysis.**
- Good analysis can help support decision-making by helping planners design the measures most effectively, not by convincing the general public or elected officials on the force of the numbers
- Simplified analysis methods (spreadsheet methods using results from research) as long as they are not off-base, can be extremely cost effective and valuable
- Making the more complex analysis methods publicly available can enable interest groups to test alternatives for themselves

ENVIRONMENTALISTS
ARE REALLY JUST
OUT TO REDUCE
THE QUALITY OF
OUR LIFESTYLE.



How does all this apply to California?

- Current Population: 38 M
- Land Area – about the size of Japan
- World's 5th or 6th biggest economy – economy about the size of France or Great Britain (at least before latest devaluation etc.)
- Growth Projections: 50 M by 2025-2030, 66 M by 2050, approaching 100 M by end of century
- **Population when CAA passed: 20 M – lost opportunities!!**



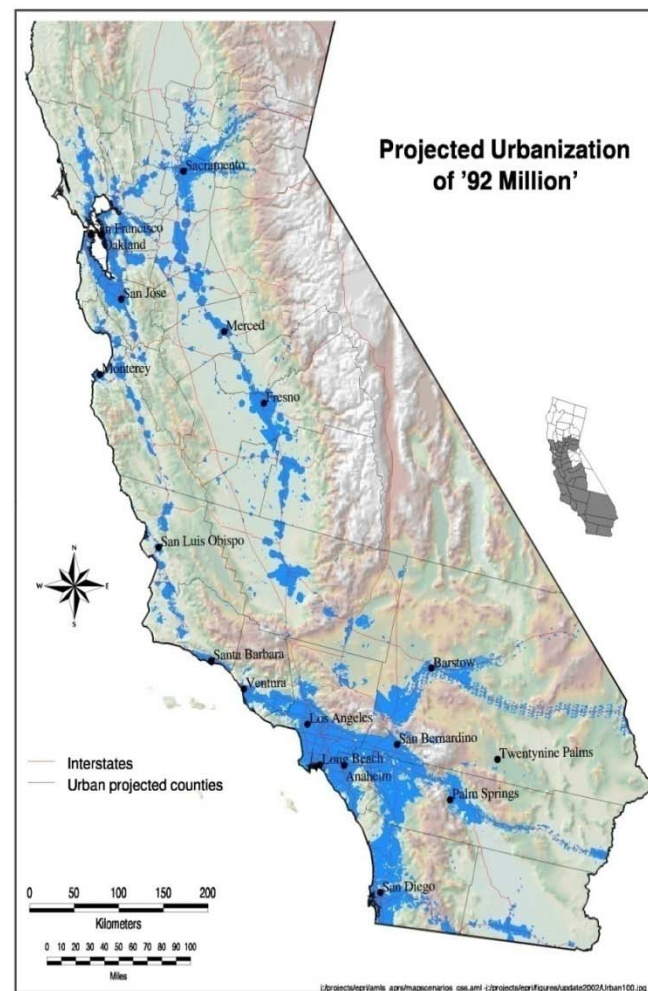
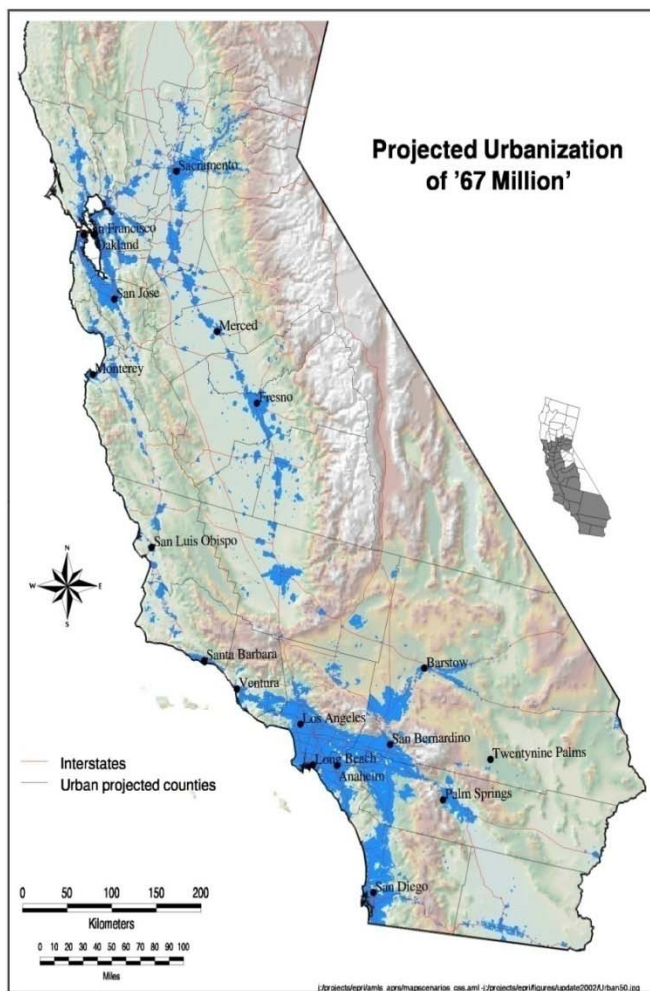
Business as Usual?

- Forecasts indicate that without more action, VKT will increase faster than population or economic activity
- Congestion will remain a big problem
- CO2 emissions will continue to grow



Development Patterns with Business as Usual

Landis, California Urban & Bio-diversity Analysis Model (CURBA)



GHG Risks to CA

- Loss of 30 - 90% of snowpack – major source of drinking & irrigation water
- Increases in wildfires
- Sea level rises and damage to coastlines
- Heat waves could become more common
- Smoggy days could increase if demand for electricity soars in summers
- Changes in vegetation – loss of habitat, species
- **Need for major expenditures for mitigation if we can't avoid, minimize – a strategy that focuses on adaptation will cost billions**

Strategies

Existing strategies could get us about half way to 2020 targets IF we are permitted to implement them:

- Tougher fuel and vehicle emissions standards
- renewable energy and efficiency requirements

AND

We still have to find other half of emissions reductions for 2020 and much more by 2050

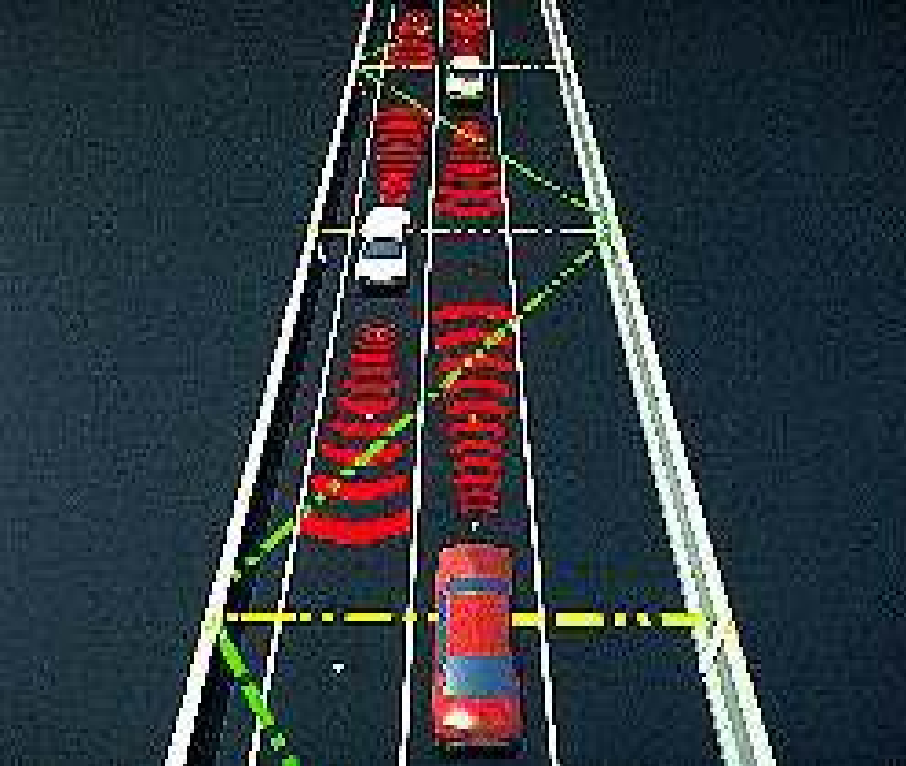
SO:

Let's get strategic in implementing what we already know we can do and provide financial incentives for accomplishments

Next Steps – Getting the Rest of the Reductions: We Know What We Need to Do:

- Continued improvements in vehicle technology, fuels
- Better traffic operations and controls
- Congestion pricing, parking pricing, pay per mile, emissions fees (on the table with incentives)
- Pedestrian- and bike-friendly development - designs and standards
- Ridesharing / carsharing – planned, casual, dynamic
- Transit-oriented development (can combine with affordable housing for majority of population)
- Infill and compact development (combine with farmland and resource protection)





HOT Lanes and Other Road Pricing Approaches



Traditional and Bike Friendly Cities



Transit-Oriented Development – Rail, BRT



Smart Steps We Can Take Now

- **Focus on implementing the things we know will work – BUILD CONSENSUS AND MOVE AHEAD!**
- **Coordinate the use of bond money** – what's left of the current bonds, and the next round (yes, we'll need more rounds) - **to support and reward smart growth:**
- **Direct housing funds to walkable, bikeable, transit-friendly communities** that are in compliance with fair share housing law -- **provide sustainable options** for the middle class and people with modest incomes
- **Get “congestion relief” through trip reduction and mode shift, not just road building**
- **Protect agriculture and resource lands and use parks and water funding to help shape urban growth**
- **Connect school bonds to smart growth**, recognizing the importance of schools to location decisions and travel

Conclusions

- We have a wealth of past experience, both analytical and empirical, that is valid to day on which to build policy and action
- To reduce transportation emissions sufficiently, we'll need for more than a technological fix - **we know we should pursue a combination of new technologies, pricing, and land use-transportation measures.**
- **The barriers to demand management, pricing, land use strategies are political agreement and community consent, not the lack of a scientific basis for action** or the need for improved analysis methods (though more research and analysis can certainly update and refine our understandings!)
- **We can be strategic and combine land use, transportation, and resource protection strategies to create a better quality of life for all of us as California grows.**
- **We need to focus on implementation issues: increasing public understanding of the issues, the need for action, and the choices before us.**

